

WHAT IS CLAIMED IS:

1. A wiring system for interconnecting at least first and second device connectors of an electronic control unit and at least first and second external connectors associated with at least one electronic device spaced apart from the electronic control unit, the first and second device connectors having a predetermined first terminal arrangement pattern, the first and second external connectors having a predetermined second terminal arrangement pattern which does not correspond to the predetermined first terminal arrangement pattern, the wiring system comprising:

at least first and second long, main harnesses each having at least one wire terminated with an end terminal at one end thereof and with a relay terminal at the other end thereof, the end terminal being inserted in an end connector and the relay terminal being inserted in a relay connector, the end connectors of the first and second main harnesses being configured for connection to the first and second external connectors;

at least first and second, short sub harnesses each having at least one wire terminated with an end terminal at one end thereof and with a relay terminal at the other end thereof, the end terminal being inserted in an end connector and the relay terminal being inserted in a relay connector, the end connectors of the first and second sub harnesses being configured for connection to the first and second device connectors, the relay connectors of the first and second sub harnesses being configured for connection to the relay connectors of the first and second main harnesses, so that at least first and second wiring harnesses are formed when the relay connectors of the first and second sub harnesses and the relay connectors of the first and second main harnesses are coupled together;

wherein the relay connectors of the first and second sub harnesses, the relay connectors and the end connectors of the first and second main harnesses include a predetermined terminal arrangement pattern that is configured to correspond to the predetermined second terminal arrangement pattern of the first and second external connectors, so that the wire of the first main harness and the wire of the second main harness extend without intersecting with each other, whereby the end and relay terminals of the first and second main harnesses can be mounted in the end and relay connectors of the first and second main harnesses respectively during subassembly, and whereby the first and second main harnesses can be sub-assembled independently of each other; and

wherein the end connectors of the first and second sub harnesses include a predetermined terminal arrangement pattern that is configured to correspond to the predetermined first terminal arrangement pattern of the first and second device connectors which does not correspond to the predetermined second terminal arrangement pattern of the first and second external connectors, so that the wire of the first sub harness and the wire of the second sub harness extend, intersecting with each other, whereby the first and second sub harnesses cannot be sub-assembled independently of each other.

2. The wiring system of claim 1, wherein the first and second sub harnesses each constitute approximately 5% to 10% of a total length of the first and second wiring harnesses, respectively.

3. The wiring system of claim 2, wherein the wires of the first and second main harnesses measure approximately 2000mm-3000mm and the wires of the first and second sub harnesses measure approximately 100mm.

4. A wiring system for interconnecting at least one device connector of at least one first electronic device and at least one second device connector of at least

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one second electronic device spaced apart from the first electronic device, the wiring system comprising:

at least one main harness having at least one group of wires aligned in a substantially parallel direction;

at least one sub harness having at least one group of wires, the group of wires having at least one wire crossover formed therein; and

a coupling structure configured to couple the main harness and sub harness together to form a complete wiring harness that extends to interconnect the first and second device connectors, with the wire crossover formed only in the sub harness and with the main harness free of any wire crossovers.

5. The wiring system of claim 4, wherein the coupling structure comprises a main harness side connector and a sub harness side connector which are mutually engageable with each other, and

wherein a plurality of electrical terminals are arranged in the main harness side and sub harness side connectors respectively in such a manner as:

(a) to correspond to an electrical terminal arrangement pattern of the first device connector so that the wires of the main harness are aligned in a substantially parallel manner; and

(b) not to correspond to an electrical terminal arrangement pattern of the second device connector so that the wires of the sub harness are not aligned in a substantially parallel manner.

6. The wiring system of claim 5, wherein the main harness comprises at least one end connector for connection to the first device connector, and wherein a plurality of electrical terminals are arranged in the end connector in such a manner as to correspond to the electrical terminal arrangement pattern of the first device connector.

7. A method of producing the main harness according to claim 5, the method comprising:

- (a) measuring the wires collectively at the same time;
- (b) mounting leading ends of the wires in pressure contact with an end connector collectively at the same time, thereby providing the end connector for connection to the first device connector at one end of the main harness;
- (c) cutting the other ends of the wires collectively at the same time; and
- (d) crimping the other ends of the wires to terminal fittings, and mounting the terminal fittings in the main harness side connector, thereby providing the main harness side connector for connection to the sub harness side connector at the other end of the main harness.

8. The wiring system of claim 4, wherein the main harness constitutes approximately 90%-95% of a total length of the wiring harness, and the sub harness constitutes the remaining portion of the total length of the wiring harness.

9. A wiring system for interconnecting at least one device connector of at least one first electronic device and at least one second device connector of at least one second electronic device, the wiring system comprising:

at least one main harness having at least one group of wires aligned in a substantially parallel direction;

at least one sub harness having at least one group of wires, the group of wires having at least one joint portion; and

a coupling structure configured to couple the main and sub harnesses together to form a complete wiring harness that extends to interconnect the first and second device connectors, with the joint portion provided only in the sub harness and with the main harness free of any joint portions.

10. A wiring system for interconnecting at least first and second device connectors provided in a first electronic device and at least first and second external connectors associated with at least one second electronic device spaced apart from the first electronic device, the wiring system comprising:

at least first and second main harnesses each having at least one group of wires aligned in a substantially parallel direction;

at least first and second sub harnesses each having at least one group of wires;

at least first and second coupling members configured to couple the first and second main harnesses and the first and second sub harnesses together respectively to form at least first and second wiring harnesses that extend to interconnect the first and second device connectors and the first and second external connectors;

wherein the wires of the first and second sub harnesses are configured to extend dispersedly between the first and second device connectors and the first and second coupling members, so that at least one wire crossover is formed, with at least one of the wires of the first sub harness intersecting with at least one of the wires of the second sub harness, whereby the main harnesses are free of any wire crossovers.

11. The wiring system of claim 10, wherein the first and second main harnesses respectively comprise first and second end connectors, wherein the first and second coupling members and the first and second end connectors respectively comprise a predetermined terminal arrangement pattern that are respectively configured to correspond to an electrical terminal arrangement pattern of the first and second external connectors, so that the wires of the first and main harness are aligned in a substantially parallel manner.

12. A composite wire harness comprising:

a main harness including only a plurality of first wires, all of said first wires aligned substantially parallel with one another;

a sub harness including a plurality of second wires, at least one of said second wires being a crossover wire; and

a connecting device configured to connect said main harness to said sub harness to form said composite wire harness.

13. The composite wire harness according to claim 12, wherein said sub harness is substantially shorter than said main harness.

14. The composite wire harness according to claim 13, wherein said sub harness has a length of approximately 5% to 10% of the length of said composite wire harness.

15. The composite wire harness according to claim 13, wherein said first wires have a length of approximately 2000 mm to 3000 m, and said second wires have a length of approximately 100 mm.

16. The composite wire harness according to claim 12, wherein the connecting device comprises a main harness side connector and a sub harness side connector which are mutually engageable with each other, and

wherein a plurality of electrical terminals are arranged in the main harness side and sub harness side connectors respectively in such a manner as:

(a) to correspond to an electrical terminal arrangement pattern of a first device connector so that said first wires of said main harness remain aligned in a substantially parallel manner; and

(b) not to correspond to an electrical terminal arrangement pattern of a second device connector so that said second wires of said sub harness are not aligned in a substantially parallel manner.

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17. The composite wire harness of claim 16, wherein said main harness comprises at least one end connector for connection to said first device connector, and wherein a plurality of electrical terminals are arranged in said end connector in such a manner as to correspond to said electrical terminal arrangement pattern of said first device connector.